

WHAT IS CLAIMED IS:

1. An injection molding method, wherein one end side
in a longitudinal direction of a cavity formed in a metal mold
5 for an injection molding is set to a charging start side of a
molten resin, another end side thereof is set to a charging
finish side, and a plurality of gates for injecting said molten
resin into the cavity are arranged from said charging start
side toward the charging finish side, and
10 wherein said molten resin is sequentially injected into
said cavity by a predetermined time difference from starting
the injection in the gate in said charging start side.
2. An injection molding method as claimed in claim 1,
15 wherein said time difference is adjusted so that the molten
resin injected from the other gates becomes in an
approximately cooled and solidified state by the time when
the molten resin injected from the final gate among a plurality
of gates reaches the terminal end in said charging finish
20 side.
3. An injection molding method as claimed in claim 1,
wherein said time difference is adjusted so that the following
molten resin is newly injected from the following gate by the
25 time when the fluid head portion of the anteceding molten

resin injected from the anteceding gate among said plurality of gates reaches a position of the following gate.

4. An injection molding method as claimed in claim 3,
5 wherein the injection of said anteceding molten resin from said anteceding gate is stopped at approximately same time when the injection of said following molten resin from said following gate is started or after a predetermined time has passed.

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5. An injection molding method as claimed in claim 3, wherein said time difference is adjusted in such a manner that the fluid head portion of said anteceding molten resin injected from said anteceding gate and the fluid head portion
15 of said following molten resin newly injected from said following gate are brought into contact with each other in a molten state at a position close to said anteceding gate rather than a position of said following gate.

20 6. An injection molding method, wherein one end side in a longitudinal direction of a cavity formed in a metal mold for an injection molding is set to a charging start side of a molten resin, another end side thereof is set to a charging finish side, and a first gate and a second gate are
25 respectively arranged in said charging start side and said

charging finish side,

wherein a second molten resin is newly injected from the second gate before a fluid head portion of the first molten resin injected from said first gate reaches a position of said
5 second gate, and

wherein said first molten resin becomes an approximately cooled and solidified state by the time when the second molten resin reaches said charging finish side terminal end within said cavity.

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7. An injection molding method, wherein one end side in a longitudinal direction of an elongated cavity formed in a metal mold for an injection molding is set to a charging start side of a molten resin, another end side thereof is set to a
15 charging finish side, and a first gate in the charging start side and a second gate in the charging finish side for injecting said molten resin into the cavity are arranged,

wherein the resin is first injected into the cavity from the first gate, the resin is next injected into the cavity from
20 the second gate, and a time difference is provided between injection timings of the first gate and the second gate in such a manner that the molten resin injected from the first gate becomes in an approximately cooled and solidified state by the time when the molten resin injected from the second gate
25 reaches the cavity end in the charging finish side, and

wherein a fluid head portion of an anteceding molten resin injected from the first gate is set not to reach a position of the second gate, a projected area of the resin injected from the first gate is made larger than a projected area of the resin injected from the second gate, a cavity portion which is not filled by the resin injected from the first gate is filled by the resin injected from the second gate having the smaller projected area than the projected area of the resin injected from the first gate, and a difference in projected area is provided between the injection resins of the first and second gates so that the projected area of the injection resin from the second gate is about one third or less of the total projected area of the entire cavity, whereby the entire of said cavity is finally filled by the resin.

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8. An injection molding method as claimed in claim 7, wherein said metal mold for injection molding is divided into a stationary mold and a movable mold, a core portion is formed in a protruding shape in a center of the movable mold, and an elongated cavity is formed in said stationary mold in correspondence to the core portion, a mold clamping state is established by fitting the core portion to the cavity and pressing mold faces of said stationary mold and the movable mold to each other, and the molten resin is thereafter injected from said first gate and the second gate with a time

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difference.

9. An injection molding method as claimed in claim 7,
wherein a first injection unit and a second injection unit are
5 independently connected to said first gate and said second
gate, respectively, the resin is first injected into the cavity
from the first gate by the first injection unit, and the resin is
next injected into the cavity from the second gate by the
second injection unit.

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10. An injection molding method, wherein an injection
portion moving along a line of a plurality of resin supplying
ports for supplying a molten resin to a cavity injects the
molten resin from the resin supplying port and thereafter
15 moves to the next resin supplying port so as to inject,
thereby injecting to all the resin supplying ports.

11. An injection molding method as claimed in claim 10,
wherein said injection portion moves to the upper resin
20 supplying ports from the lower end resin supplying port in a
plurality of resin supplying ports arranged in a vertical
direction, and injects the molten resin into said cavity.

12. An injection molding method as claimed in claim 10,
25 wherein the injection of said molten resin from said injection

portion to one resin supplying port is finished by a detection sensor provided in a predetermined position of said cavity for detecting a charging amount of the molten resin, and said injection portion moves to the other resin supplying ports.

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13. An injection molding method as claimed in claim 10, wherein before the injection of the molten resin from one resin supplying port is finished by the injection portion and said molten resin is solidified, the resin is injected from the
10 next resin supplying port.

14. An injection molding apparatus comprising:

an elongated cavity formed in a metal mold for an injection molding;

15 a plurality of resin supplying ports arranged in a longitudinal direction of said cavity and provided for injecting a resin to the cavity;

an injection portion provided so as to freely move along a direction of arrangement of said resin supplying
20 ports; and

an injection portion driving apparatus sequentially moving the injection portion to a position in correspondence to said resin supplying port.

25 15. An injection molding apparatus as claimed in claim

14, wherein one end and another end of said elongated cavity are positioned apart from each other in a vertical direction, and said injection portion moves between one end side and another end side of said cavity.

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16. An injection molding apparatus as claimed in claim 14, wherein a detection sensor for detecting a charging amount of the molten resin is provided in a predetermined position of said cavity.

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17. An injection molding apparatus as claimed in claim 14, further comprising a hot runner with a shutoff function for preventing the molten resin from flowing out.

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18. An injection molding apparatus comprising:

an elongated cavity formed in a metal mold for an injection molding;

a plurality of resin supplying ports arranged in a longitudinal direction of said cavity and provided for injecting

20 a resin to the cavity;

an injection portion provided so as to freely move along a direction of arrangement of said resin supplying ports; and

25 an injection portion driving apparatus sequentially moving the injection portion to a position in correspondence

to said resin supplying port,

wherein the molten resin is injected from each of the resin supplying ports while feeding a gas into the cavity so as to pressurize the cavity at a time of injecting the resin
5 from each of the resin supplying ports, the gas pressurization is finished just before the resin is injected from the final resin supplying port, the resin is injected from the final resin supplying port, and the charging is finished.

10 19. An injection molding apparatus as claimed in claim 18, wherein said elongated cavity is formed so that one end and another end thereof are positioned apart from each other by a predetermined amount in a horizontal direction.

15 20. An injection molding method, wherein a plurality of resin supplying ports are provided in an elongated cavity in which one end and another end are positioned apart from each other in a vertical direction, stationary injection mechanisms of the same number as the resin supplying ports
20 are placed in said resin supplying ports, a molten resin injection is begun from said injection portion positioned in a lower end in a longitudinal direction of said cavity, the molten resin is sequentially injected from the upper injection portions, and the charging of the cavity is finished by
25 injecting from the uppermost injection portion.